has been brought out by FISCHER[16] in the case of the gymnosporangia inhabiting Juniperus. A casual attempt to infect *Sorbus aria*, *S. aucuparia*, and some other species, with teleutospores obtained from *Juniperus communis* and supposed to be those of *Gymnosporangium tremelloides*, resulted in no infections. This experiment showed that the teleutospores were neither those of *G. tremelloides* nor those of *G. juniperinum*, whose aecidial host is *Sorbus aucuparia*. These results led to a series of cross infections, in which the teleutospores of the Gymnosporangium were used to infect a number of pomaceous plants, and aecidial spores from these plants were sown on Juniperus. The work showed that two forms of Gymnosporangium occur on *Juniperus communis* and *J. nana*. The first form occurs chiefly on the stems and branches, rarely on the leaves, and has its aecidial form on *Amelanchier ovalis*. The first aecidia appear on *A. ovalis* 55 to 60 days after the sowing of teleutospores, and the teleutospores appear on Juniperus about 20 months after the sowing of aecidiospores. For this form the specific name *Amelanchieris*, originally applied to the Roestelia on Amelanchier, is reserved. The second form occurs chiefly on the leaves of Juniperus, and has its aecidial form on *Sorbus aucuparia*, but does not infect *A. ovalis*. The aecidia appear 45 to 50 days after the sowing of teleutospores, and teleutospores are produced in the spring following the sowing of the aecidiospores in late summer. This is the form known as *G. juniperinum*.

For a discussion of the history, nomenclature, and geographical distribution of the two forms, as well as of their respective hosts, the reader is referred to the original paper.—H. HASSELBRING.

Fermentation of tobacco.—Theories relating to the fermentation of tobacco have been based either on the view that the process is due to bacterial action, or to the action of enzymes without the intervention of bacteria. One investigator alone, SCHLOESING, seems to have believed that the later part of the fermentation is due to purely chemical oxidations. In view of these conflicting theories describing the process, the experiments of BOEKHOUT and DEVRIES are especially interesting.[17] These authors attacked the problem by methods similar to those used in their recent work on the spontaneous heating of hay. Dry samples of cured tobacco were sealed up in tubes with oxygen or air, and in some cases water was added to the samples. The tubes were then heated to 100° or to 33°, according to the purpose of the experiment, and after a definite period of heating the gas in the tubes was analyzed. It was found that oxidation took place at both tempera tures, but more rapidly at the higher temperature. The presence of water increased the rate of oxidation. By the process of oxidation carbon dioxid was liberated and oxygen was fixed. It was found that starch and pentosans were

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[16] FISCHER, ED., Studien zur Biologie von *Gymnosporangium juniperinum*. Zeit. Bot. 1:683–714. *figs. 8.* 1909.

[17] BOEKHOUT, F. W., AND DEVRIES, O. J. J., Ueber Tabaksfermentation. Centralbl. Bakt. II. 24:496–511. 1909.

the principal substances which disappeared. In seeking for a catalyzer, iron and manganese were considered. It was found that starch paste with traces of ferrosulfate was completely hydrolyzed in six days at 100°. In a similar experiment without iron salts no hydrolysis took place.

The authors conclude from their work that the fermentation of tobacco is a process of oxidation, in which iron salts may act as catalyzers. They believe that it is almost certain that the processes are of a purely chemical nature, that is, take place without the action of enzymes or bacteria.—H. HASSELBRING.

Ascent of water.—DIXON recounts[18] some experiments intended to show that the living cells of the wood do not influence the rate at which water is transmitted through a stem. Arguing that if there is any sort of action which even facilitates the passage of water upward, its effect would be noticeable experimentally by a downward filtration of water more rapid in a killed stem than in a living one, he arranged two like shoots of syringa so that he could keep the two at the same temperature and could determine the amount of water that would pass downward through them, both being alive, under a given head of pressure in a short time, say 10 minutes. One shoot was then killed, by steam or by poison, with no disturbance, and the amount of water transmitted by both again determined. No appreciable or constant difference was found; whence DIXON argues that vital action is at least unlikely.

On the basis of the strain borne by the water of a soap-bubble film, DIXON calculates that the tensile strength of water, even when saturated with air, is not less than 42.5 *A*, a figure which agrees fairly well with BERTHELOT's early determination, 50 *A*, to which he calls attention. In another paper,[19] DIXON presents some further experimental work on this point. He finds a tensile strength under certain conditions of more than 150 *A*. There is no longer doubt that the cohesion of water is sufficient to stand the strain involved in a lift; but what are the resistances to be overcome? EWART says about 50 *A*; DIXON thinks this too high, and suggests a maximum of 20 *A* for the tallest trees (100^m). In the absence of determinations of the osmotic pressure in the leaves of such trees, DIXON thinks it fair to assume that it is as much as 20 *A*. Others will deny the assumption. And, as Mr. Dooley pointedly says, "There y' are!"—C. R. B.

Life of pollen.—PFUNDT,[20] working under the guidance of PFEFFER, has determined the viability of pollen in air of various degrees of humidity. Incidentally he presents many data regarding the germination of pollen that will be useful.

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[18] DIXON, H. H., Vitality and the transmission of water through the stems of plants. Notes from the Botany School of Trinity College 2:5–18. 1909.

[19] ———, Note on the tensile strength of water. *Ibid.* 38–43. Both "Reprinted from Proc. Roy. Dublin Soc.," without citation of volume or pages.

[20] PFUNDT, MAX, Der Einfluss der Luftfeuchtigkeit auf die Lebensdauer der Blüthenstaubes. Jahrb. Wiss. Bot. **47**:1–40. 1909.